

REMARKS

A rejection on these claims was previously overturned in a Pre-Appeal Brief Review Conference. The subsequent Office Action cited no new 102(b) prior art and still fails to make a *prima facie* case of unpatentability based on 102(b) prior art. The newly cited § 102(e) references are overcome with an inventor declaration. The § 112 rejections are also not valid.

I. Rejections Under 35 U.S.C § 112

Regarding the rejection of independent claims 10, 13, 17 and 24 for being indefinite, the Examiner has expressed confusion that the chemical formulation of the polymer nanoparticle is indefinite. Specifically, the rejection stated that since the outer and inner layer could be formed from the same alkenylbenzene monomer, then the claims are indefinite because they require a diblock polymer (which must have two different blocks). In a phone interview conducted on December 3, 2008 (and summarized in the concurrently filed Examiner Interview Summary), the Examiner also alleged that it was indefinite to have an inner and outer layer if the first and second monomer were the same.

A. Claim 10 is not Indefinite

In response, Applicants submit that the Markush group limitation and the requirement for a diblock polymer chain serve to further limit each other. A diblock polymer requires a selection of two different monomers for each block. Thus, the additional claim requirement for a diblock polymer chain simply further limits the selection of the monomers. The same monomer cannot be selected for both blocks in the diblock polymer chain. There is nothing indefinite with these

claim requirements that serve to further limit each other. Furthermore, an inner and outer layer may still exist if both include the same monomer. For example, an inner layer is defined in claim 10 by the first block of the diblock polymer chains.

2. Claim 24 is not Indefinite

It appears the Examiner's only § 112 concern with claim 24 is that both the inner and outer layer can have the same monomer and this makes it unclear how the inner and outer layer are defined. However, an inner and outer layer may still exist if both include the same monomer. In claim 24 an inner layer is defined where the cross-linking agent has cross-linked the polymer chains.

3. Claim 13 is not Indefinite

The Office Action did not appear to separately reject dependent claim 13, but to the extent it is rejected, the same arguments recited above for claim 10 apply to this claim also. Claim 13 even addresses the issue raised by the Examiner as it further requires that "the diblock polymer chains do not have the same monomer units in both the outer layer and the inner layer."

4. Claim 17 is not Indefinite

The Office Action did not appear to separately reject dependent claim 17, but to the extent it is rejected, the same arguments recited above for claim 10 also apply to this claim.

II. Rejections Under § 102(e)

The Office Action cited U.S. Patent No. 6,956,084 to Wang and U.S. Patent 6,875,818 to Wang against the pending claims. These rejections are overcome by the Inventor Declaration under 37 C.F.R. § 1.132 which states that any relevant subject matter disclosed, but not claimed in the prior applications originated from the inventors of the current application. Thus, these prior patents are not prior art “by another.” Accordingly, the rejections under 35 U.S.C. § 102(e) are overcome.

III. Rejection for Double Patenting

The Office Action cited U.S. Patent 6,875,818 to Wang against the pending claims for non-statutory double patenting. A terminal disclaimer is submitted to overcome this rejection.

IV. Rejections Under 35 U.S.C. § 102(b)

U.S. Patent No. 6,437,050 to Krom was cited as allegedly anticipating claims 10-17, 23-25, 27-31, and 34-35 of the application. This reference had been previously applied as part of an obviousness rejection that was overturned in a Pre-Appeal Brief Conference Review.

A. Claims 10-17, 23, and 34 are not Anticipated

Claim 10 requires mono-block polymer chains as part of the nanoparticle. Krom does not teach or suggest this feature.

The fact that Krom does not teach or suggest mono-block polymer chains as part of the nanoparticle was supported by a Declaration submitted under 37 C.F.R. § 1.132 by two Ph.D.

research scientists¹ that cited to a well-known and respected text on the subject of living anionic polymerization. This Declaration has not been properly considered by the Examiner, and this was a prime point of contention in the Pre-Appeal Brief Conference Review. As a result of the Review, prosecution was reopened; however, the Examiner continues to allege that Krom discloses mono-block polymer chains in its nanoparticles.

In the Office Action, the Examiner stated that the nanoparticles of Krom can be in the form of a diblock copolymer and that the styrene monomer units in the nanoparticles of Krom are “homo-styrene block” (monoblock). Despite the clear teachings of Krom and the evidence submitted in the Declaration that the “homo-styrene block” of Krom is part of a diblock chain in the nanoparticle, the Examiner erroneously concludes that this is a disclosure of a mono-block polymer chain. Applicants and the Examiner agree that mono-block polymer means a homopolymer. However, a block of a diblock polymer chain cannot be considered to be a homopolymer itself. No person of ordinary skill in the art would read Krom as disclosing monoblock polymers in the nanoparticle.

The monoblock polymers required by the claims are more than mere design choices, as can be seen in the Examples of the invention, where varying the monoblock polymer content increases the polydispersity of the nanoparticles.

In the telephone interview, the Examiner attempted to argue, again, that the disclosure at column 3, lines 16-19 of Krom shows that a mono-block polymer chain would be created and present in the nanoparticles of Krom. However, as previously argued in Applicant’s successful

¹ Both Dr. Wang and Dr. Pawlow are employed by the owner of this application.

Pre-Appeal Brief Conference Review Request, the interpretation of what would occur when additional monomer is added in Krom at column 3, lines 16-19, is unsupported by any evidence. Such allegations on chemical theories cannot be made without support. *See*, MPEP § 2144.03(A) (“assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. *In re Ahlert*, 424 F.2d at 1091, 165 USPQ at 420-21. *See also In re Grose*, 592 F.2d 1161, 1167-68, 201 USPQ 57, 63 (CCPA 1979) (“[W]hen the PTO seeks to rely upon a chemical theory, in establishing a prima facie case of obviousness, it must provide evidentiary support for the existence and meaning of that theory.’).” Nonetheless, Applicant’s have refuted this allegation, and with the submission of the Declaration, the only evidence of record contradicts the Examiner’s allegations.

Accordingly, because the recited mono-block polymer limitation is not taught or suggested by Krom, independent claim 10 and its dependent claims should be allowed over the cited art.

In addition, claim 10 also contains the polydispersity limitation that is discussed below in Section IV.B, and for this additional reason, claim 10 and its dependent claims should be allowed over the cited art.

B. Claims 24-25, 27-31, and 35 are not Anticipated

In previous Office Actions, the Examiner had correctly noted that Krom did not disclose the limitation of a polydispersity index of about 1.5 to 10. However, when prosecution was reopened after the Pre-Appeal Brief Conference Review, the current Office Action stated that

this element was disclosed in Krom. Krom does not disclose this limitation either expressly or inherently.

The Office Action points to Krom's disclosure of "a nanoparticle" with a weight-average molecular weight of 100,000 to 3,000,000, and alleges that this broad range means that the nanoparticles of Krom must have a broad molecular weight distribution (hence a high polydispersity). This disclosure in Krom is completely irrelevant to the polydispersity of a group of nanoparticles.

First, the disclosure is about "a nanoparticle" not a collection of nanoparticles. The range of molecular weights are simply examples of what the weight average molecular weight of "a nanoparticle" may be. It does not even speak about a collection of nanoparticles, and there must be a collection of things for polydispersity to be relevant. Thus, Krom's disclosure of example weights for a single example nanoparticle are irrelevant to the polydispersity limitation of the claims.

Second, even if the disclosure in Krom was about a collection of nanoparticles that can have a value within a broad range of example weight-average molecular weights, this does not mean that the number-average molecular weight of the same collection of nanoparticles would not have an equal or nearly equal value in the range. Thus, it does not indicate that the nanoparticles have high polydispersity (M_w/M_n). In fact, the only indication of polydispersity of the nanoparticles in Krom, is that they are preferably substantially monodisperse, with a M_w over M_n ratio of 1 being substantially monodisperse. (Krom, column 2, lines 11-13.) Krom also discloses that the nanoparticles preferably have a polydispersity of less than about 1.3, but more

preferably less than about 1.1. (Krom, column 2, lines 13-15.) No person of skill in the art would read the claim limitation of “polydispersity index between about 1.5 and about 10” in the Krom reference.

The polydispersity limitation of the claims is more than a mere design choice. It was discovered that higher degrees of polydispersity were achieved by adding monoblock (homopolymer) chains to the nanoparticles. This allowed the creation of nanoparticles of higher polydispersity by manipulating the ration of mono-block and di-block polymers.


Accordingly, because the recited polydispersity limitation is not taught or even suggested by Krom, independent claim 24 and its dependent claims should be allowed over the cited art.

V. New Claims 36 and 37

New claims 36 and 37 are also patentable over the cited references. They further recite ranges of monoblock to diblock polymer chains that are not disclosed in the prior art.

Respectfully submitted,

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